

Fig. 1

Fig. 2

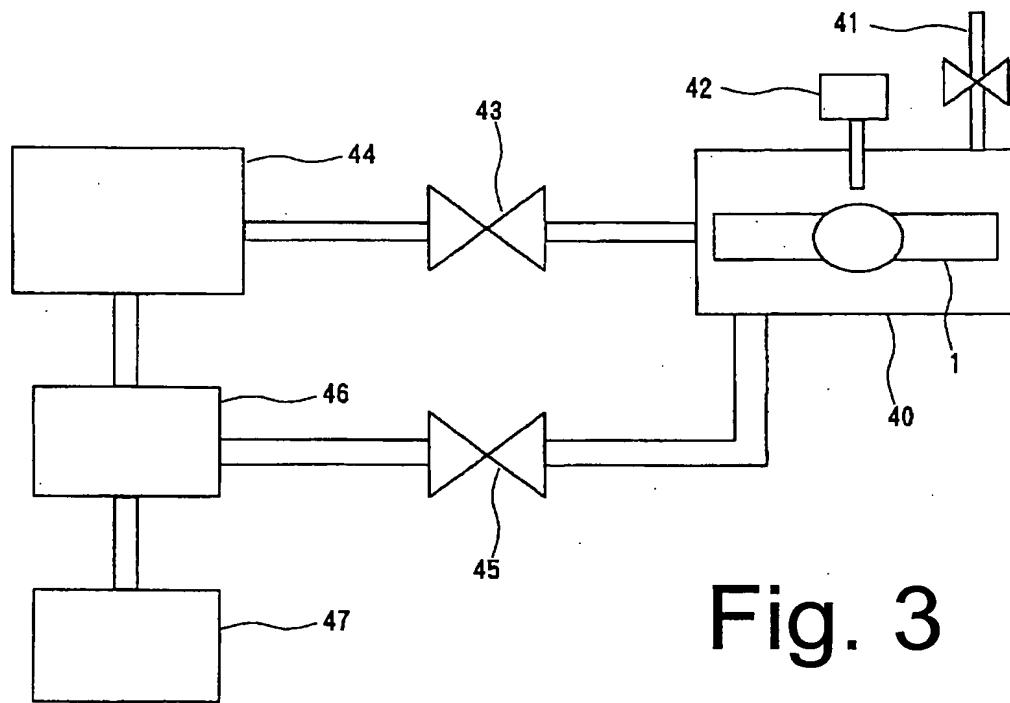
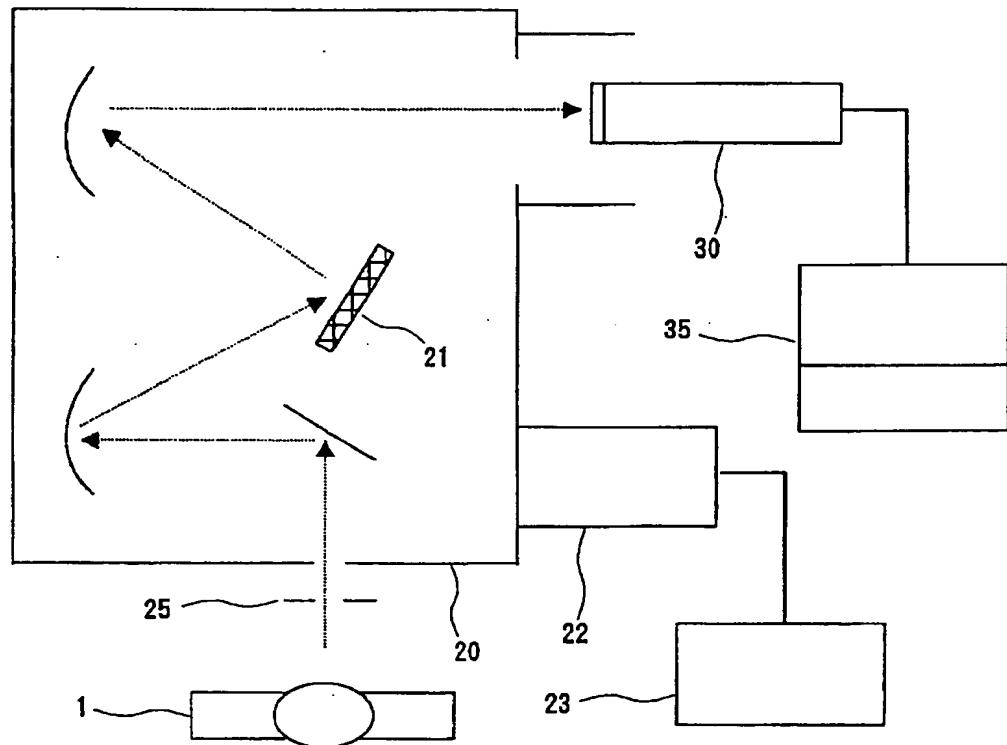


Fig. 3

Fig. 4

	Mixing ratio of the encapsulated gases O <sub>2</sub> /Ar (%)	Condition for the degassing treatment of the material of which the discharge vessel is formed	Condition for the thermal treatment of the electrodes	Ratio b/a	Ratio c/a	Ratio d/a	Ratio e/a	Lumen maintenance factor (%)	Value of the increase of the voltage (V)	Concentration of the carbon compounds (ppm)	Evaluation
1 (comparison)	0	G 1	H 3	3.0 x 10 <sup>-5</sup>	1.6 x 10 <sup>-1</sup>	2.1 x 10 <sup>-4</sup>	4.0 x 10 <sup>-4</sup>	37	13.0		X
2 (comparison)	0	G 3	H 1	6.5 x 10 <sup>-5</sup>	6.0 x 10 <sup>-3</sup>	4.0 x 10 <sup>-2</sup>	8.8 x 10 <sup>-4</sup>	44	9.0		X
3 (comparison)	0	G 3	H 3	9.7 x 10 <sup>-6</sup>	4.0 x 10 <sup>-3</sup>	6.0 x 10 <sup>-4</sup>	3.9 x 10 <sup>-4</sup>	47	8.5		X
4 (comparison)	0.1	G 1	H 1	2.5 x 10 <sup>-5</sup>	2.2 x 10 <sup>-1</sup>	6.9 x 10 <sup>-4</sup>	3.6 x 10 <sup>-2</sup>	55	11.0	3000	X
5 (comparison)	0.1	G 1	H 2	2.0 x 10 <sup>-4</sup>	1.8 x 10 <sup>-1</sup>	1.5 x 10 <sup>-4</sup>	4.5 x 10 <sup>-3</sup>	48	11.5		X
6 (comparison)	0.1	G 1	H 3	1.5 x 10 <sup>-4</sup>	1.9 x 10 <sup>-1</sup>	2.7 x 10 <sup>-4</sup>	4.8 x 10 <sup>-4</sup>	44	8.0		X
7 (comparison)	0.1	G 2	H 1	3.0 x 10 <sup>-4</sup>	2.7 x 10 <sup>-2</sup>	5.5 x 10 <sup>-4</sup>	4.0 x 10 <sup>-2</sup>	50	9.5	600	X
8 (invention)	0.1	G 2	H 2	4.5 x 10 <sup>-4</sup>	5.4 x 10 <sup>-2</sup>	3.1 x 10 <sup>-4</sup>	1.2 x 10 <sup>-2</sup>	83	8.0	300	0
9 (invention)	0.1	G 2	H 3	3.5 x 10 <sup>-4</sup>	1.4 x 10 <sup>-1</sup>	4.4 x 10 <sup>-4</sup>	6.3 x 10 <sup>-4</sup>	87	15.0	200	0
10 (comparison)	0.1	G 3	H 1	2.0 x 10 <sup>-4</sup>	7.2 x 10 <sup>-3</sup>	4.8 x 10 <sup>-2</sup>	5.5 x 10 <sup>-4</sup>	52	12.0		X
11 (invention)	0.1	G 3	H 2	1.0 x 10 <sup>-4</sup>	4.5 x 10 <sup>-3</sup>	4.5 x 10 <sup>-3</sup>	1.8 x 10 <sup>-4</sup>	85	11.0	400	0
12 (invention)	0.1	G 3	H 3	1.5 x 10 <sup>-4</sup>	4.8 x 10 <sup>-3</sup>	7.2 x 10 <sup>-4</sup>	3.3 x 10 <sup>-4</sup>	90	7.5	100	0
13 (comparison)	0.5	G 1	H 1	6.0 x 10 <sup>-4</sup>	2.1 x 10 <sup>-1</sup>	5.0 x 10 <sup>-4</sup>	3.4 x 10 <sup>-2</sup>	43	25		X
14 (comparison)	0.5	G 1	H 2	5.3 x 10 <sup>-3</sup>	2.1 x 10 <sup>-1</sup>	8.1 x 10 <sup>-4</sup>	5.2 x 10 <sup>-3</sup>	39	15		X
15 (comparison)	0.5	G 1	H 3	3.4 x 10 <sup>-3</sup>	1.9 x 10 <sup>-1</sup>	4.5 x 10 <sup>-4</sup>	4.8 x 10 <sup>-4</sup>	45	16		X
16 (comparison)	0.5	G 2	H 1	7.2 x 10 <sup>-4</sup>	6.0 x 10 <sup>-2</sup>	3.6 x 10 <sup>-4</sup>	3.8 x 10 <sup>-2</sup>	50	14	1000	X
17 (invention)	0.5	G 2	H 2	1.2 x 10 <sup>-2</sup>	1.1 x 10 <sup>-1</sup>	7.5 x 10 <sup>-4</sup>	1.4 x 10 <sup>-2</sup>	92	12	500	0
18 (invention)	0.5	G 2	H 3	7.9 x 10 <sup>-3</sup>	6.0 x 10 <sup>-2</sup>	5.8 x 10 <sup>-4</sup>	6.4 x 10 <sup>-4</sup>	90	8.5	300	0

Fig. 5

	Mixing ratio of the encapsulated gases O <sub>2</sub> /Ar (%)	Condition for the degassing treatment of the material of which the discharge vessel is formed	Condition for the thermal treatment of the electrodes	Ratio b/a	Ratio c/a	Ratio d/a	Ratio e/a	Lumen maintenance factor (%)	Value of the increase of the voltage (V)	Concentration of the carbon compounds (ppm)	Evaluation
19 (comparison)	0.5	G 3	H 1	4.8 x 10 <sup>-3</sup>	6.8 x 10 <sup>-3</sup>	4.6 x 10 <sup>-2</sup>	7.6 x 10 <sup>-4</sup>	48	23		X
20 (invention)	0.5	G 3	H 2	2.6 x 10 <sup>-3</sup>	5.2 x 10 <sup>-2</sup>	5.2 x 10 <sup>-3</sup>	1.3 x 10 <sup>-4</sup>	88	16	500	0
21 (invention)	0.5	G 3	H 3	3.4 x 10 <sup>-3</sup>	4.8 x 10 <sup>-3</sup>	7.3 x 10 <sup>-4</sup>	3.3 x 10 <sup>-4</sup>	92	12	320	0
22 (comparison)	1	G 1	H 1	4.8 x 10 <sup>-3</sup>	2.0 x 10 <sup>-1</sup>	5.0 x 10 <sup>-4</sup>	4.1 x 10 <sup>-2</sup>	36	14		X
23 (comparison)	1	G 1	H 2	1.1 x 10 <sup>-1</sup>	2.4 x 10 <sup>-1</sup>	8.3 x 10 <sup>-4</sup>	5.3 x 10 <sup>-3</sup>	51	8	900	X
24 (comparison)	1	G 1	H 3	4.0 x 10 <sup>-2</sup>	2.0 x 10 <sup>-1</sup>	1.2 x 10 <sup>-4</sup>	4.8 x 10 <sup>-4</sup>	37	7.5		X
25 (comparison)	1	G 2	H 1	5.8 x 10 <sup>-3</sup>	5.9 x 10 <sup>-2</sup>	6.0 x 10 <sup>-4</sup>	4.6 x 10 <sup>-2</sup>	45	11		X
26 (invention)	1	G 2	H 2	9.5 x 10 <sup>-2</sup>	1.3 x 10 <sup>-1</sup>	9.0 x 10 <sup>-4</sup>	9.0 x 10 <sup>-3</sup>	90	12.5	600	0
27 (invention)	1	G 2	H 3	6.5 x 10 <sup>-2</sup>	9.0 x 10 <sup>-2</sup>	1.0 x 10 <sup>-4</sup>	6.3 x 10 <sup>-4</sup>	87	16	150	0
28 (comparison)	1	G 3	H 1	7.2 x 10 <sup>-2</sup>	6.7 x 10 <sup>-3</sup>	5.5 x 10 <sup>-2</sup>	4.0 x 10 <sup>-4</sup>	46	25		X
29 (invention)	1	G 3	H 2	5.2 x 10 <sup>-2</sup>	6.0 x 10 <sup>-3</sup>	1.2 x 10 <sup>-2</sup>	3.3 x 10 <sup>-4</sup>	89	14	300	0
30 (invention)	1	G 3	H 3	1.2 x 10 <sup>-1</sup>	5.1 x 10 <sup>-3</sup>	7.2 x 10 <sup>-4</sup>	4.5 x 10 <sup>-4</sup>	91.5	8.5	440	0
31 (comparison)	2	G 1	H 3	2.5 x 10 <sup>-1</sup>	2.0 x 10 <sup>-1</sup>	1.4 x 10 <sup>-4</sup>	4.0 x 10 <sup>-4</sup>	44	8		X
32 (comparison)	2	G 3	H 1	1.9 x 10 <sup>-2</sup>	6.7 x 10 <sup>-3</sup>	1.5 x 10 <sup>-2</sup>	7.3 x 10 <sup>-4</sup>	41	16		X
33 (comparison)	2	G 3	H 3	1.4 x 10 <sup>-1</sup>	4.8 x 10 <sup>-3</sup>	6.0 x 10 <sup>-4</sup>	3.5 x 10 <sup>-4</sup>	---	---		X